

Claims:

1. A plastic sheet (1) having a number of recessed and protruded parts produced by thermal processing to form a number of uneven parts consisting of a protruding, truncated cone-shaped part (12) and a recessed, ring-shaped part (13) surrounding and continuing from the protruding part on a plane (11) of a plastic sheet.

2. The plastic sheet (1) according to claim 1, wherein the height (H) of the protruding, truncated cone-shaped part (12) from the bottom of the cone is larger than the depth (D) of the recessed, ring-shaped part (13).

3. The plastic sheet (1) according to claim 1, wherein the height (H) of the protruding, truncated cone-shaped part (12) from the bottom of the cone is substantially the same as the depth (D) of the recessed, ring-shaped part (13).

4. The plastic sheet (1) according to claim 1, wherein the height (H) of the protruding, truncated cone-shaped part (12) from the bottom of the cone is smaller than the depth (D) of the recessed, ring-shaped part (13).

5. A two-layered double wall sheet (2A) produced by adhering a flat liner sheet (5) to the tops of the truncated cones (12) of the plastic sheet (1) having a number of recessed and protruded parts according to claim 2 or claim 3.

6. A two-layered double wall sheet (2B) produced by laminating a flat liner sheet (5) to the plane (11) of the plastic sheet (1) having a number of recessed and protruded parts according to one of claims 2 to 4.

7. A two-layered double wall sheet (2C) produced by adhering a flat liner sheet (5) to the bottom of the recessed, ring-shaped part (13) of the plastic sheet (1) having a number of recessed and protruded parts according to one of claims 2 to 4.

8. A three-layered double wall sheet (3) produced by adhering a flat liner sheet (5) or flat back sheet (4) to the double wall sheet (2A, 2B or 2C) defined in one of claims 5 to 7, on the side opposite to the side on which a back sheet or a liner sheet is already adhered.

9. A method of producing the plastic sheet (1) defined in claim 1, comprising the steps of: feeding a plastic sheet in the molten state extruded from a T-die to a vacuum forming roll, which rotates around the axis at the center and has plural projections and ring-shaped recesses each surrounding the projections and vacuum suction passages therein; forming plural protruded, truncated cone-shaped parts and recessed, ring-shaped parts surrounding and continuing from the protruding parts to have the parts evenly distributed on a plane of the plastic sheet, and peeling the formed plastic sheet from the vacuum forming roll.

10. A method of producing the two-layered double wall sheet (2A,

2B or 2C) defined in one of claims 5 to 7, comprising the steps of, further to the steps defined in claim 9, feeding another flat plastic sheet in the molten state extruded from another T-die to the tops of the plural truncated cone-shaped parts or to the flat surface of the sheet so as to adhere by fusion to give the liner sheet, or to the bottoms of the recessed, ring-shaped parts so as to have the flat sheet adhered by fusion to give the back sheet to the plastic sheet.

11. A method of producing the two-layered double wall sheet (2A, 2B or 2C) defined in claims 5 to 7, comprising the steps of, further to the steps defined in claim 9, feeding another flat plastic sheet in the molten state extruded from another T-die to the bottoms of the plural recessed, ring-shaped parts of the plastic sheet peeled from the vacuum forming roll so as to adhere by fusion to give the back sheet, or to the tops of the plural truncated cone-shaped parts or to the flat surface of the plastic sheet so as to have the flat sheet adhered by fusion to give the liner sheet.

12. A method of producing the three-layered double wall sheet defined in claim 8, comprising the steps of, further to the steps defined in claim 9, giving the liner sheet or back sheet to the plastic sheet by the method defined in claim 10, and then, giving the back sheet or the liner sheet to the plastic sheet by the method defined in claim 11.

13. An apparatus for carrying out the method of producing the plastic sheet having a number of recessed and protruded parts

defined in claim 9, comprising: a vacuum forming roll cylinder (6) made of metal, which is supported rotatably around the axis (62) thereof, and inside of which is connected to a vacuum source; forming plugs (7A) having vacuum suction passages and fixed on the surface of the forming roll cylinder so that the tops of the plugs may be higher than the surface of the cylinder; and a vacuum system allowing connection of the plugs to the vacuum source only when the plugs are in a certain rotational position.

14. The forming plug used in the apparatus for producing defined in claim 13, comprising a head (71A), which is a positive projection of the shape corresponding to the protruded, truncated cone-shaped part, and a base (72A) with threads for fixing the plug to the forming roll cylinder, the plug forming the negative part together with the recessed part provided on the surface of the forming roll cylinder to give the ring-shaped recess, and having vacuum suction grooves around the base.

15. The forming plug used in the apparatus for producing defined in claim 13, comprising a head (71B), which has a negative recess (75) of the shape corresponding to the protruding part and a positive projection (76) of the shape corresponding to the recessed part surrounding the negative recess to give the ring-shaped recess to the flat plastic sheet, and a base (72B) with threads for fixing the plug on the forming roll cylinder (6), plug (7B) having a vacuum suction hole at the bottom of the negative recess and the vacuum suction grooves (77) around the positive projection of the base.